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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/074,926	02/14/2002	James Robert Howard		8465

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James Howard
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EXAMINER

MACCHIAROLO, PETER J

ART UNIT	PAPER NUMBER
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2879

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/074,926

Applicant(s)

HOWARD ET AL.

Examiner

Peter J Macchiarolo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 11-13, 24 and 25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 11-13, 24 and 25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03/19/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. The reply filed on 03/19/2004 consists of changes to the specification, drawings, and to the claims, and further, the reply consists of remarks related to the prior rejection of claims in the previous Office Action. However, pending claims 1-12 are not allowable as explained below.

Drawings

2. The amended drawings have been received on 03/19/2004 and are accepted.

Specification

3. The specification amendment filed 03/19/2004 has not been entered, but is objected to because it does not conform to 37 CFR 1.125(b) and (c) because: the statement as to a lack of new matter under 37 CFR 1.125(b) is missing, and a marked-up copy of the specification amendment has not been supplied (in addition to the clean copy).
4. Another version of any replacement paragraph(s), on one or more pages separate from the amendment, marked up to show all the changes relative to the previous version of the paragraph(s). The changes may be shown by brackets (for deleted matter) or underlining (for added matter), or by any equivalent marking system. A marked up version does not have to be supplied for an added paragraph or a deleted paragraph as it is sufficient to state that a particular paragraph has been added, or deleted. See CFR 37 § 1.121.

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5. The Examiner appreciates that the amendment to the specification merely changes the reference numerals to reflect changes to the drawings, but patent law requires the statement under 37 CFR 1.125(b) and a marked-up copy of the specification to complete the amendment.

6. Currently, the original Specification is objected to since it contains reference numerals not in the new drawings. Appropriate action is required.

Claim Objections

7. Claims 1-12 are objected to because of the following informalities:

8. The original numbering of the claims must be preserved throughout the prosecution. When claims are canceled the remaining claims must not be renumbered. When claims are added, they must be numbered by the applicant consecutively beginning with the number next following the highest numbered claim previously presented (whether entered or not). When the application is ready for allowance, the examiner, if necessary, will renumber the claims consecutively in the order in which they appear or in such order as may have been requested by applicant. See MPEP § 1.126. For the purpose of examination, the Examiner will refer to the claims as numbered in the marked-up amendment to the claims for the rest of this office action.

9. Further, claim 1 and 24 recite the limitation, "the optical elements" in line 6 and 3, respectively. There is not proper antecedent basis for this limitation.

10. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. **Claim 24 is rejected under 35 U.S.C. 102(b) as being anticipated by Wojnarowski et al (USPN 5,525,190; "Wojnarowski").**

12. In regards to claims 24, Wojnarowski discloses in figures 5 and 11, a printed circuit board (PCB), comprising multiple layers (86, 88, 104) laminated about optical generation, transmission and reception elements, the optical elements including a generation device (52, 80), a transmission element (66, 74) to provide an optically clear path between generation and reception elements, and a reception device (50b, 82), wherein at least one of the optical elements is electrically connected in the Z-axis (via metalized conductor fig. 11, 92).

13. The Examiner notes that the limitation in claims 1 and 24, "intended to be connected to at least one printed circuit board element or surface device" is an intended-use type limitation. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 1-7, 11-13, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over previously cited Wojnarowski in view of previously cited Howard et al (USPN 5,155,655; "Howard").

15. In regards to claims 1-4, Wojnarowski discloses in figures 5 and 11, a printed circuit board (PCB), comprising multiple layers (86, 88, 104) laminated about optical generation, transmission and reception elements on a ceramic substrate (120), the optical elements including a generation device (52, 80), a transmission element (66, 74) to provide an optically clear path between generation and reception elements, and a reception device (50b, 82), wherein at least one of the optical elements is electrically connected in the Z-axis (via metalized conductor fig. 11, 92) to at least one printed circuit board element or surface device.

16. Wojnarowski is silent to the substrate being a capacitor laminate including two sheets of conductive material and one sheet of intermediate dielectric material.

17. However, Howard teaches that using a capacitor laminate as a substrate for PCB's provides a number of important advantages in PCB design.¹

18. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the PCB of Wojnarowski, and using Howard's capacitor

¹ Howard, col. 2, ll. 39-46.

laminate instead of Wojnarowski's ceramic substrate, since this configuration will benefit from the advantages as taught by Howard.

19. The Examiner notes that the claim limitations in claims 2-4 are drawn to processes of manufacturing which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing of an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation is not afforded patentable weight (see MPEP 2113).

20. In regards to claims 11-13, Wojnarowski further shows in figure 4 that the optical elements are laminated within the PCB. Wojnarowski further shows in figures 12-14, a method of constructing a PCB which allows the addition of a second level of electro-optical devices built adjacent to the same dielectric layer.

21. Wojnarowski is silent to multiple layers of optical elements.

22. However, one of ordinary skill in the art can infer from Wojnarowski's figures 12-14 that multiple layers of optical elements are possible, making a more compact and efficient device.

23. Furthermore, having multiple layers with the above configuration is a matter of obvious design choice, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Further, one of ordinary skill in the art will appreciate that layering Wojnarowski's PCB, as shown in figure 11, will decrease the physical size needed for multiple opto-electrical connections, which will have a clear advantage in some markets.

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24. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the PCB of Wojnarowski and Howard with multiple layers of Wojnarowski's device.

25. In regards to claims 5-7, and 25, Wojnarowski and Howard teach all of the recited limitations of claims 2-4, and 11 (above).

26. Wojnarowski further teaches and shows in figure 11 that other electro-optical devices, such as senders and receivers, may be connected to the optical reception device, and have blind vias which connect the electro-optical device to other PCB elements through the Z axis by the use of blind, buried, or subcomposite vias.

Response to Arguments

27. Applicant's arguments filed 03/19/2004 have been fully considered but they are not persuasive.

28. First, Applicant alleges that the Wojnarowski does not show the z-axis electrical connection is used as the conduit for carrying the signal content that the current application shows, and Wojnarowski does not show a Z axis electrical connection between the electro-optical elements and devices on the surface.

29. The Examiner respectfully refutes that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. See *In re Casey*, 152

USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). The electrical connection of Wojnarowski anticipates Applicant's claimed electrical connection, i.e. at least one of the optical elements is electrically connected in the Z-axis (see also Wojnarowski, fig. 11, 92). Further, one of ordinary skill in the art will be able to select an appropriate surface device in which to connect Wojnarowski's metalization layer 92 (see numbered paragraph 13 above).

30. Second, Applicant alleges Howard does not contemplate the use of directly mounted components on the capacitive layer.

31. The Examiner respectfully points out that the claim language used by Applicant does not require the components mounted directly on the capacitive layer. Instead, the claim language recites, "elements formed on a capacitor laminate." Furthermore, the Examiner respectfully submits that one of ordinary skill in the art would arrive at mounting Wojnarowski's PCB on Howard's capacitor laminate in view of Howard's teachings (see numbered paragraphs 13-17). Further, the title alone of Howard teaches this configuration ("Capacitor laminate for use in capacitive printed circuit boards and methods of manufacture"), and Howard motivates this in a number of places, (see for example col. 1, ll. 14-15).

32. Applicant further alleges Wojnarowski describes a method of construction which does not readily permit the placement of devices on any internal layer within.

33. The Examiner would like to reiterate that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing of an unobvious

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difference between the claimed product and the prior art, a subject product-by-process claim limitation is not afforded patentable weight (see MPEP 2113).

34. Also, it is noted that although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). As Applicant admits at Arguments, 24-27, Wojnarowski describes a PCB which may comprise multiple layers of optical elements. Even though Wojnarowski does not show the exact same structure as Applicant's invention, Wojnarowski teaches Applicant's claim language, and consequently the rejection stands.

Conclusion

35. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

36. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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37. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J Macchiarolo whose telephone number is (571) 272-2375.

The examiner can normally be reached on 8:30 - 5:00, M-F.

38. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar Patel can be reached on (571) 272-2475. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

39. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

pjm


ASHOK PATEL
PRIMARY EXAMINER